



I-66 Pavement Rehabilitation

**Fall Asphalt Conference
Richmond, VA**

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Pavement Rehabilitation

FROM ROUTE 50 TO I-495 • Fairfax County

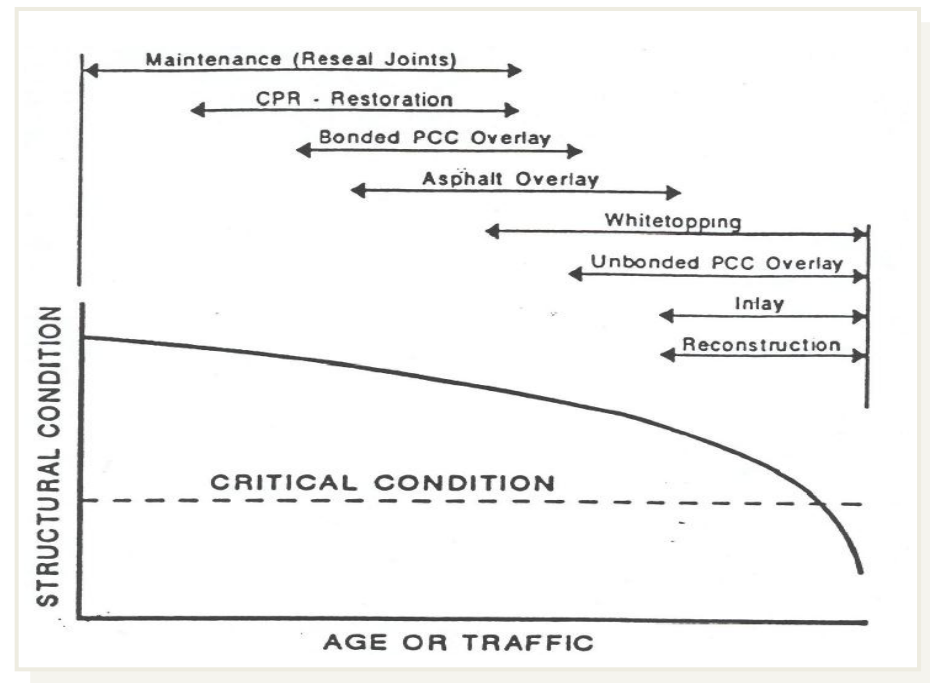
- **Goal**
 - Provide a cost effective pavement rehabilitation that will last for 20 years with minimum disruption to the traveling public
- **Challenges for Pavement Rehabilitation**
 - Limited space for Maintenance of Traffic (MOT)
 - Limited times for dual lane closures
 - Limited overhead clearance for existing bridges
 - Drainage
 - Concrete barriers
 - Lane shifts across longitudinal joints in concrete
 - Coordination with adjacent Mega Projects

Pavement Structure

- **Original Construction, 1960 to 1963**
 - 9" concrete pavement, wire mesh reinforcement, 61.5' transverse joint spacing
 - 6" plain aggregate
 - 6" soil cement
 - 20-year design life; design ADT was 22,350 vpd
- **Widening, 1990 to 1993**
 - Original 2 lanes widened to 4 lanes (Route 50 to east of Route 123)
 - 3 lanes widened to 4 lanes (east of Route 123 to I-495)
 - Outside shoulder used as fourth lane during peak demand periods
 - 11" concrete pavement, 15' transverse joint spacing
 - 4" Stabilized open graded drainage layer
 - 6" Cement treated aggregate (CTA)

Pavement Condition

- Summary of Condition Data
- Average CCI of 58 in 2007; range from 13 to 86
- 36,500 sy of patching mainline; 9,850 sy of patching on ramps/loops/CD roads
- Distresses concentrated in distinct areas
- 15% of transverse joints failing in load transfer based on 1995 FWD testing



Courtesy: American Concrete Pavement Association
 "Concrete Paving: Pavement Rehabilitation Strategy Selection"

Pavement Condition

- Old Pavement in Poor Condition
 - Approximately 20% of total pavement area in poor condition
 - Distresses generally at transverse joints
 - Isolated slabs have distress (spalling) throughout



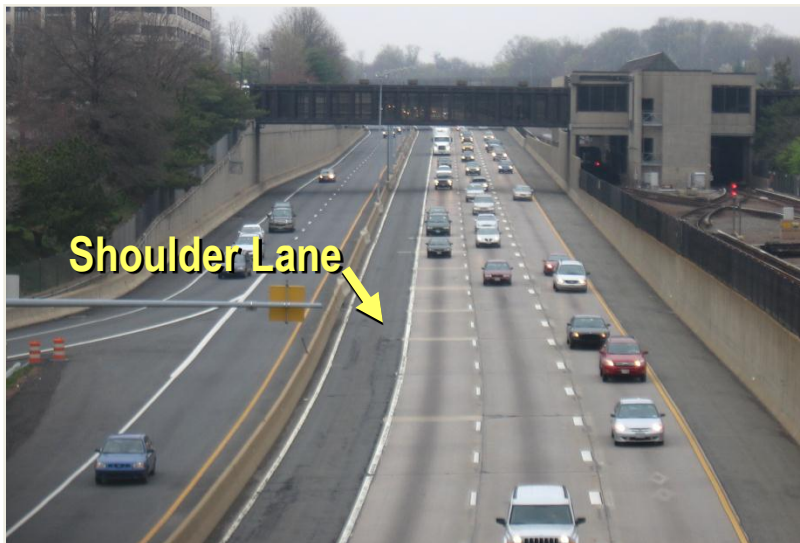
Pavement Condition

- Significant Amount of Good Pavement
 - Some pavement is in good condition
 - Some patches in good condition
 - Pavement in good condition between transverse joints



Challenges for Pavement Rehabilitation

- Limited Space for Maintenance of Traffic
 - Outside shoulder is currently used as travel lane in peak hours (5:30 am to 11:00 am EB and 2:00 pm to 8:00 pm WB)
 - Inside shoulder is only 2'-8' wide
 - No shoulders at some bridge locations; no shoulders on CD road at Nutley Street (retaining walls)



Challenges for Pavement Rehabilitation

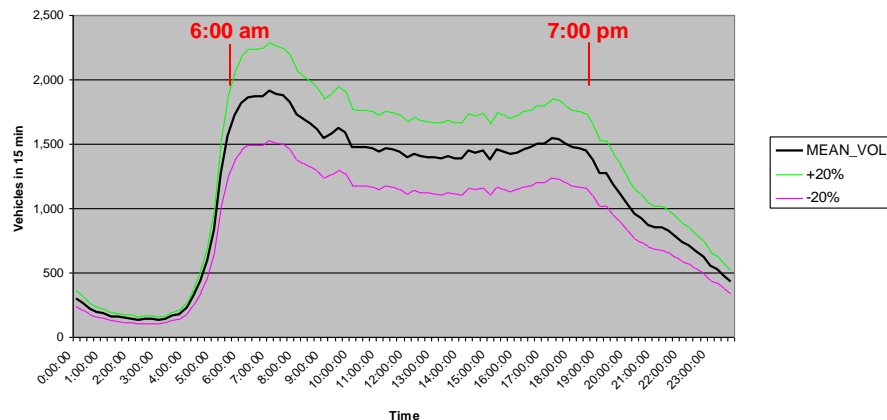
- Limited Times for Dual Lane Closures
 - Weekdays 10:00 pm to 5:00 am (EB)/6:00 am (WB)
 - Saturday and Sunday 7:00 pm to 9:00 am



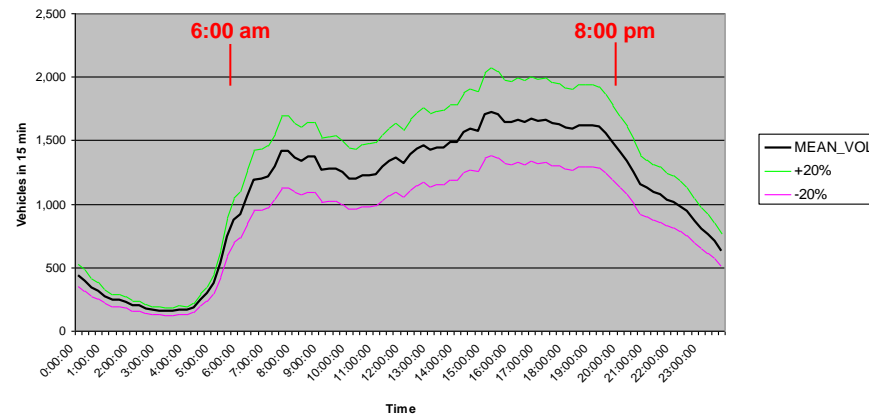
Challenges for Pavement Rehabilitation

- Hourly Traffic Volumes

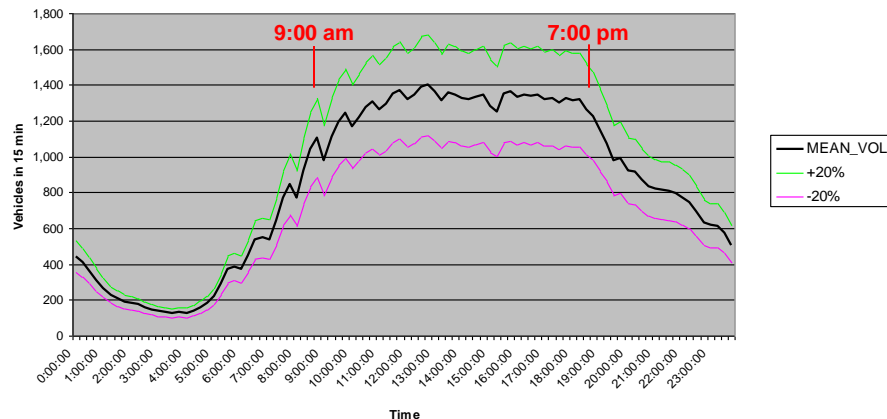
Average Volume in 15 minutes at Det 392 Group at MP 59.11
(EB Friday)



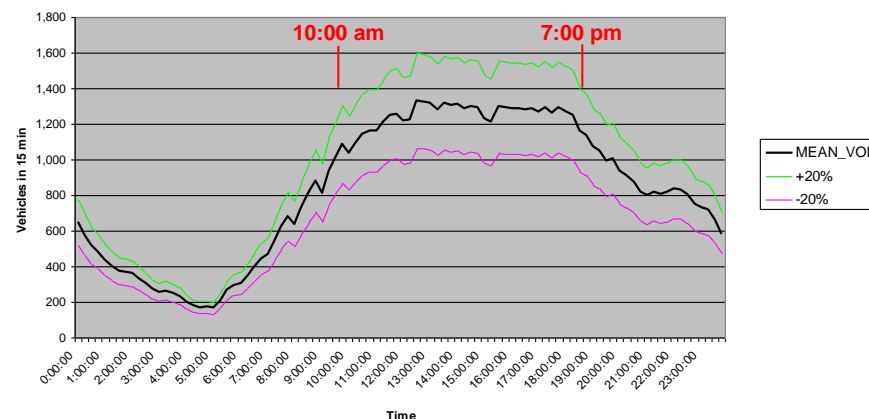
Average Volume in 15 minutes at Det 411 Group at MP 61.43
(WB Friday)



Average Volume in 15 minutes at Det 392 Group at MP 59.11
(EB Saturday)

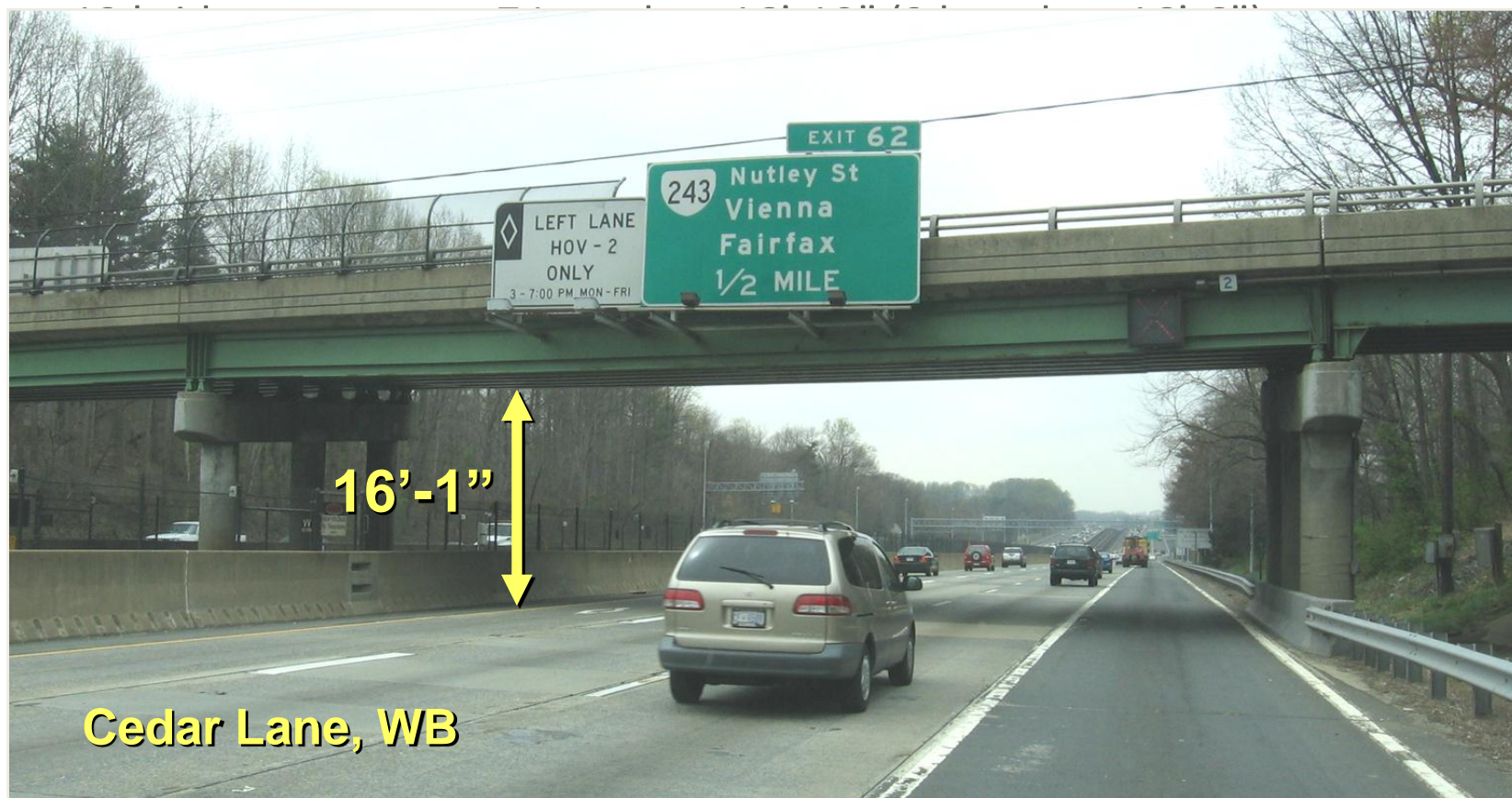


Average Volume in 15 minutes at Det 405 Group at MP 63.74
(WB Saturday)



Challenges for Pavement Rehabilitation

- Limited Overhead Clearance for Existing Bridges



Challenges for Pavement Rehabilitation

- Drainage
- Inlets extend into shoulder travel lane



Challenges for Pavement Rehabilitation

- Concrete Barriers
- Median and WMATA (5 miles “locked in”)



Challenges for Pavement Rehabilitation

- Lane shifts across Longitudinal Joints in Concrete



Challenges for Pavement Rehabilitation

Co-ordination with adjacent Mega Projects

- I-495 HOT Lanes
- Dulles Rail



Project Approach

Development

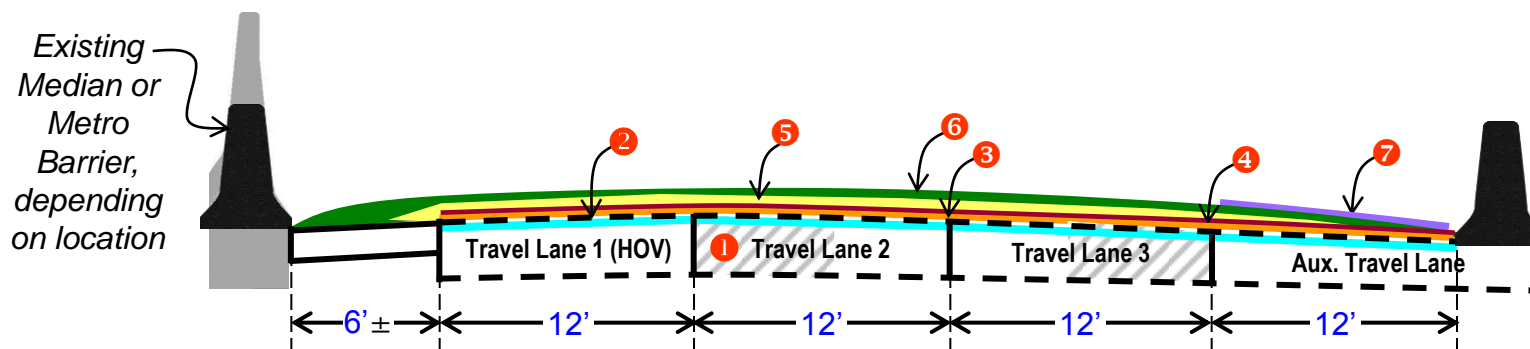
- Met with industry associations (concrete and asphalt) on May 20, 2008
- Received industry suggestions/proposals on June 18, 2008
- Provided follow-up comments to industry
- Follow-up details received from industry on June 23 and June 24, 2008
- Performed comparison of alternatives
- Project was funded and advertised in September, 2010
- Delivery mechanism was design-build (pavement repairs specifically identified on RFP plans)
- Awarded to Fort Myer Construction Company on December 20, 2010
- Total Contract Amount - \$37.9 million







Scope of Work



- ① Patch badly deteriorated concrete pavement with full-depth concrete patches and seal joints
- ② Patch minor spalling with asphalt
- ③ Seal joints, eradicate pavement markings, remove snow plowable raised pavement markers
- ④ Place 5/8" Thin Hot Mix Asphalt Concrete Overlay stress absorbing membrane interface layer
- ⑤ 2" SMA-12.5 (PG 76-22, polymer modified)
- ⑥ 1-1/2" SMA-9.5 (PG 76-22, polymer modified)
- ⑦ 3/8" High Friction Surface Course to delineate auxiliary travel lane

Scope of Work

- Issues:
- All existing barriers (both WMATA and median) have 2" reveal; reconstruct/re-face existing barriers but not WMATA barrier due to modifications required for existing drainage inlet throats
- Existing cross slope on auxiliary travel lane varied up to 8.3%; bring this up to standard (except at tapers beneath existing bridges)
- Design exception for cross slope up to 12.6% on inside shoulder
- Taper build-up to zero beneath low clearance bridges; survey and drainage analysis needed
- Adjust drainage inlets and grates in auxiliary shoulder lane

Concrete Patching

- Extremely rough pavement with failed patches and joints
- Full depth concrete patches



Concrete Patching

- Patch minor spalls with asphalt or partial depth patches



Concrete Patching

- Total 55,572 sy full-depth (12,004 EB; 36,214 WB; 7,355 on Ramps)
- 4,697 sy partial depth



THMACO

- Pavement surface very rough after concrete patches
- Spray bar paver
- Heavy tack



SMA Overlay

- 2" SMA-12.5 (76-22)
- Scratch course for leveling
- 1.5" SMA-9.5 (76-22)



Concrete Jersey Barrier

- Retrofit 23,600 lf with constant slope barrier
- Slip-form over existing barrier
- Drainage inlets required special formwork



Final Rideability

Lane	Average IRI (ins./mi.)	
	EB	WB
1	50	48
2	49	48
3	46	46
4	--	48

Note: project design-build specification required average IRI < 70 ins./mi.
with no individual 0.01 mile section >80 ins./mi.

High Friction Surface Course

- Delineate part-time shoulder pavement with a different color as a safety improvement



Delivered Fall 2012...

...a **safer**, and **smoother**, **I-66** !



Questions ?

